January 20, 2006

TO: Marjean Magraw
FROM: Curtis Noonan

RE: Selected studies currently being conducted at
Center for Environmental Health Sciences
University of Montana

PI: Noonan, CW
Title: "Assessing the impact on air quality and children's health of actions taken to reduce PM2.5 levels from woodstoves"
Funding: Health Effects Institute (pending)

Aim 1. Prospectively measure ambient and indoor PM2.5 levels during and following the implementation of a community-wide woodstove replacement program to test the hypothesis that a woodstove intervention program will substantially reduce community woodsmoke-derived PM exposures.

a) Ambient and school indoor PM2.5 mass, organic carbon (OC) to elemental carbon (EC) ratio, and woodsmoke markers will be determined during the high exposure winter periods and during the low exposure early fall and late spring periods.

b) Residential indoor PM2.5 mass, OC/EC ratio, and woodsmoke markers will be determined for selected homes during the winter to determine if ambient reductions in PM2.5 are reflected in indoor residential measurements.

Aim 2. Prospectively track respiratory symptoms and infections among Libby children to test the hypothesis that intervention-driven reductions in PM2.5 levels will result in reductions in children's respiratory symptoms. Parents of school children will complete a symptom questionnaire at the end of each air monitoring period, and we will evaluate changes in winter-time reporting of respiratory symptoms.

Aim 3. Prospectively track school absences to test the hypothesis that intervention-driven reductions in PM2.5 levels will improve school attendance. School absences will be tracked during the study period, and time series analysis will be used to determine if changes and variations in ambient PM2.5 levels are associated with school absence counts.

PI: Noonan, CW
Title: "Community woodsmoke exposure and health measures in asthmatic children"
Funding: NIEHS (pending)

Aim 1. Determine whether variations in ambient woodsmoke-derived PM are associated with adverse respiratory effects.

a) Pulmonary function tests (PFT) and exhaled nitric oxide (NO) will be measured in children with and without asthma during high exposure and low exposure periods.
b) Longitudinal lung function growth will be evaluated among children in a community with improving winter-time woodsmoke exposures for comparison with children in a community with stable winter-time exposures.

Aim 2. Determine whether variations in ambient woodsmoke-derived PM are associated with biomarkers of respiratory oxidative stress and immune activation. Biomarkers of effect in exhaled breath condensate (EBC) (i.e., H2O2, 8-epiPGF2-a, and cytokines) in children with and without asthma will be measured during high and low exposure seasons.

Aim 3. Determine if alternative measures of PM2.5 and woodsmoke exposure are more strongly associated with respiratory measures than ambient PM2.5.
a) School indoor and residential indoor measures of PM2.5 will be compared to PFT, exhaled NO, and oxidative stress and immune biomarkers; and
b) Markers of woodsmoke exposure (e.g., methoxyphenols, levoglucosan, and abietic acids) in air filter samples and urine samples will be compared to PFT, exhaled NO, and oxidative stress and immune biomarkers.

PI: Noonan, CW and Laskin, J
Title: "The impact on respiratory function from wildland fire smoke"
Funding: None
Overview: Pilot study to measure lung function among a group of disabled adults attending a physical therapy clinic. This project will be initiated if/when a wildland fire impacts the Missoula airshed.

PI: Noonan, CW and Pfau, JC
Title: "Nested case-control study of autoimmune disease in an asbestos-exposed population"
Funding: None
Overview: Review of existing data collected during asbestos related disease screening program in Libby, MT. Records were reviewed for systemic autoimmune diseases and history of asbestos exposure.

PI: Ward, TJ
Title: "Baseline Ambient Concentrations of Polycylic Aromatic Hydrocarbons and Selected Phenolics before a Woodstove Change-Out Program in Libby, MT"
Funding: Hearth, Patio & Barbecue Association
In 2004 UM-CEHS developed a research program to measure the baseline levels of PAHs prior to the implementation of a wood stove change-out program. It is theorized

that as a result of this change-out program, ambient PM2.5 concentrations will decrease over the next several years in Libby. We are currently in the second year of this program.

PI: Holian, A.
Co-PI: Finley, F., Salish Kootenai College
Title: "Environmental Health Science Education for Rural Youth"
Funding: $1.2 million under a 5-yr NCRR-NIH Science Education Partnership Award
The goal of this project is to improve science literacy by making information and materials culturally appropriate and comprehensible to a broad audience, including Native Americans, rural residents, and groups most affected by environmental health problems and disparities in health outcomes. Planning and implementation activities will focus on: 1) strengthening the partnership among CEHS, SKC, and a network of community-based education groups to enhance environmental health science education at the K-12 level; 2) developing culturally appropriate strategies and materials relating to environmental health science, emphasizing hands-on, inquiry-based activities about health-related subjects such as air toxins, water pollution, and other environmental public health priorities; 3) disseminating information on environmental health science by means of a mobile science center and multi-media programs, making materials understandable, accessible, and relevant in the context of rural Montana; and 4) expanding public support for integrating environmental health training in K-12 schools in ways that are consistent with rural workforce and educational needs as well as the diverse cultural and socioeconomic character of Montana.